Article

# Endemic study of typhoid fever between male and female population of Ali Pur, Islamabad

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## ABSTRACT

AIM: To study the number of typhoid fever cases among male and female population of Ali Pur, Islamabad. METHODS: The study was designed by Department of Medical Laboratory Technology, University of Haripur. Sample was collected from January 1st 2016 to December 31st 2016 in the region of Ali Pur, Islamabad. A total of 905 samples were collected from both male and female population for typhoid fever in the region of Ali Pur Islamabad. The samples were centrifuged at high speed to obtain serum. All samples were screened for typhoid fever by using immunochromatographic (ICT) technique. RESULTS: In this study there were 422 female patient's and 483 male patients. Among female participants, 30.3% were positive for IgM antibodies and 1.7% were positive for IgG antibodies while 1.4% were positive for both IgG and IgM antibodies. Similarly, among male participants, 28.2% were positive for IgM antibodies, 0.8% were positive for IgG antibodies and 2.3% were positive for both IgM and IgG antibodies. In female participants, IgM and IgG levels were little higher than in male participants. CONCLUSION: The acute phase of typhoid in females is higher than in males. Chronic phase of typhoid is also somewhat higher than in males, but an increased level of IgG and IgM ratio was seen in the case of male participants.

**KEYWORDS:** Typhiod fever; IgM; IgG; Ali Pur; epidemiology

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## INTRODUCTION

The epidemiology of typhoid fever traced back reverses to the standard study by Austin Flint in 1843 (1). Typhoid fever transmits through the use of dirty water or food and is mainly caused by Salmonella enterica serovar Typhi (typhoid fever) or Salmonella enterica serovar Paratyphi A, B or C (paratyphoid fever) (2). Salmonella is a Gram-negative bacillus, facultative anaerobe, generally characterized by milder symptoms like fever, headache, constipation, depression, anorexia, relative bradycardia and diarrhea, but sever symptoms like gut perforations, encephalitis and, in strict situation, deaths have normally been reported (3). Worldwide there are 27 million new cases and 200,000 deaths annually (4). In 2008, it was reported that among the Asian countries India and Pakistan had elevated incidence rates of enteric fever compared to Indonesia, China and Vietnam (5, 6). A study conducted in Bangladesh at some point in 2001 showed that along with febrile illness, typhoid fever was the top one and was nearly 72.7% (7). Another study conducted in 2003 reported that water borne infections cause 250,000 deaths every year in Pakistan among which typhoid fever is the primary cause (8).

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## MATERIAL AND METHODS

This is an endemic study, which was designed by the Department of Medical Laboratory Technology, University of Haripur and conducted from January 1st 2016 to December 31st 2016. Samples were collected from primary laboratory Bio Clinical Laboratory Ali Pur, Islamabad. A detailed history was taken from all participants. Patients inclusion criteria were febrile illness with history of fever of 2-3 days, headache and illness seven days prior to sampling. Total of 3 mL of whole blood was collected aseptically by vein puncture technique from patients in sterile gel tubes and serum was separated by centrifugation at and 3000 rpm for 5 minutes. Serum was evaluated using the Typhoid IgG/IgM rapid test device method. The test simultaneously detects and differentiates IgG and IgM antibodies to S. typhi specific antigen in the serum (9). Informed consent was obtained from all participants.

## RESULTS

Total of 905 tests were performed for the detection of IgM and IgG antibodies. There were 422 female and 483 were male participants.

In women, 30.3% were positive for IgM antibodies, 1.7% were positive for IgG antibodies and 1.4% were positive for both IgG and IgM antibodies (Figure 1).

Similarly, in men, 28.2% were positive for IgM antibodies, 0.8% were positive for IgG antibodies and 2.3% were positive for both IgM and IgG antibodies (Figure 2).

IgM positive ratio was little bit higher in women than in men and IgG positive ratio was also higher in women than in men. The age range was from 15 year to 60 years.

## DISCUSSION

Typhoid fever is a multi-systemic infectious disease caused by Salmonella typhi, and is still (21stcentury) considered as endemic public health problem in developing countries (10). Another emerging problem in developing countries is the use of empiric antibiotics among suspected typhoid fever patients (11). This ultimately leads towards increased antibiotics resistance among common pathogens. It is necessary to use a simple, clinical and inexpensive laboratory tests for decision-making therapy.

Typhoid fever is still prevalent in rural areas and attributable to the lack of safe drinking water supply, poor hygiene and contaminated food. Like in other Asian countries, typhoid fever can be an important indicator of socio-economic condition of the population (12). Sulaiman and Sarwari (2007) reported that the most notorious hotspots for typhoid fever worldwide are Pakistan, India, Egypt, Mexico, Indonesia, Peru and Nepal (13). In this study, clinical isolates from suspected patients were collected for one year to check the epidemiological status of typhoid fever in Islamabad. To diagnose the acute

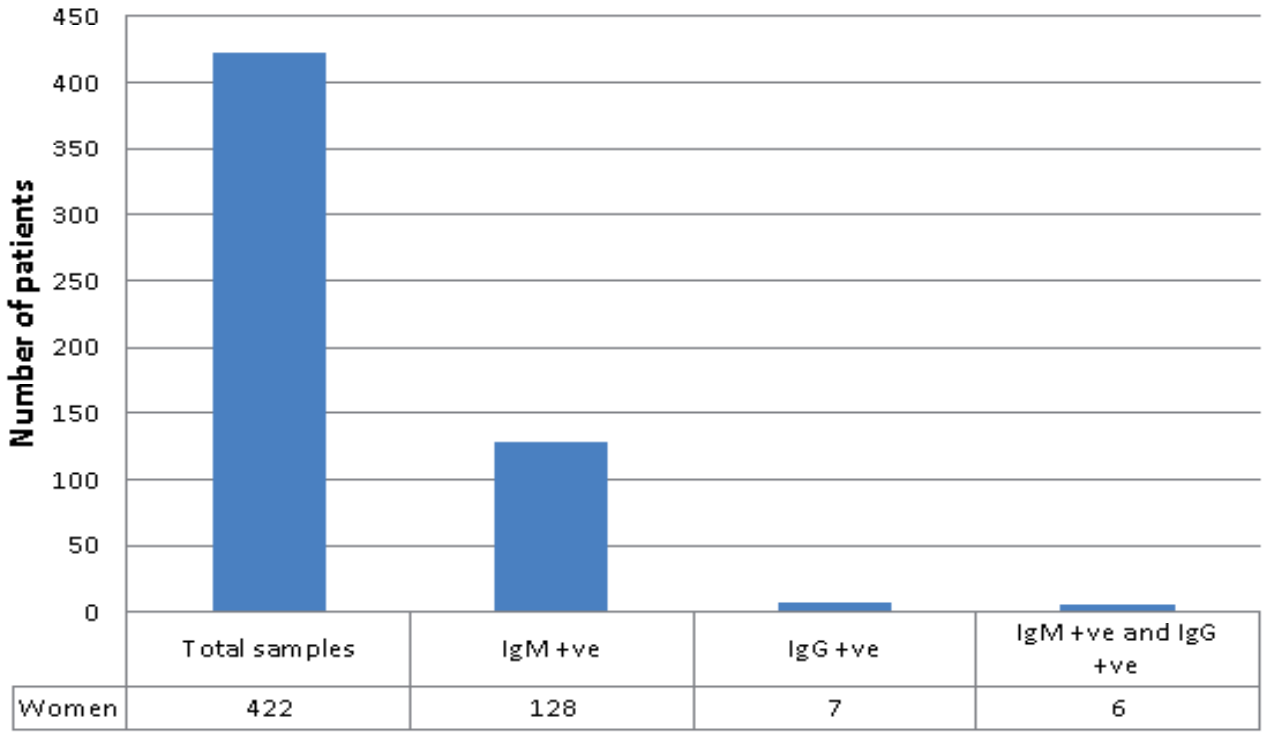


**Figure 1.** Prevalence of typhoid fever in the female population of Ali Pur, Islamabad.

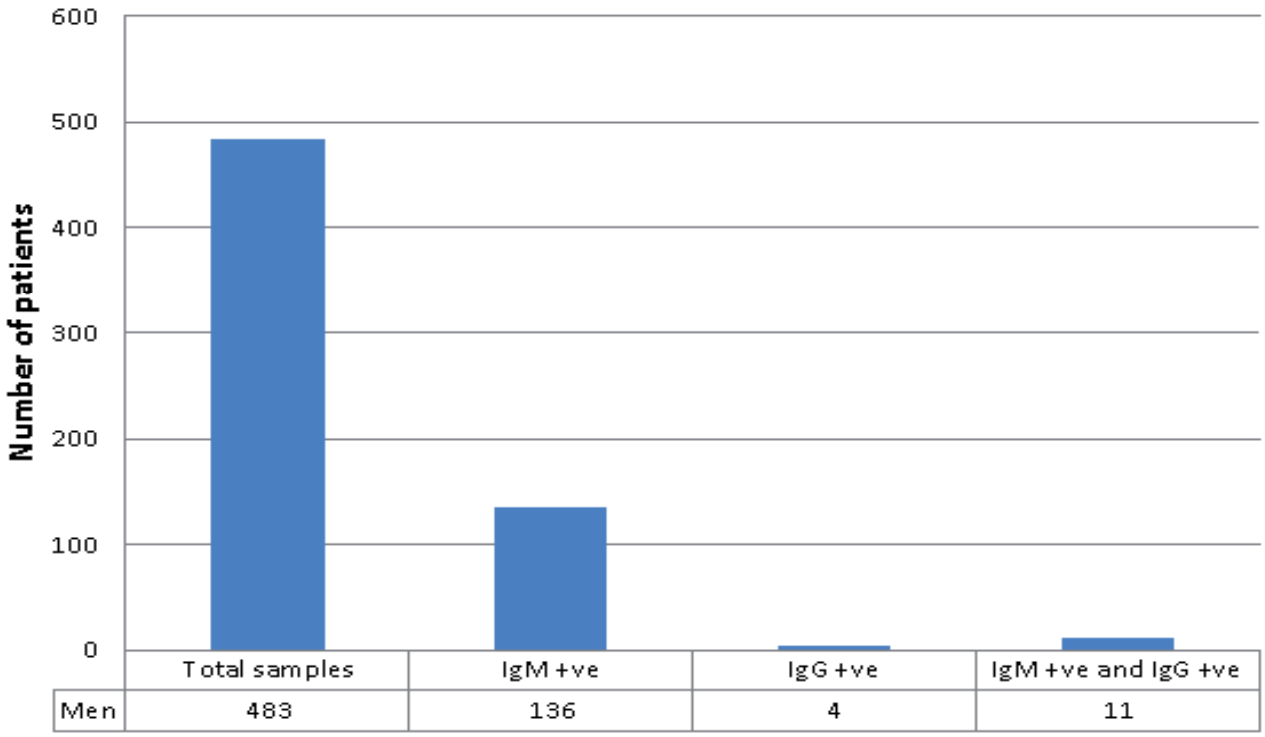


**Figure 2.** Prevalence of typhoid fever in the male population of Ali Pur, Islamabad.

and chronic stage of typhoid fever, Typhidot® rapid serology test has been used. Typhidot® test is cheap, single-use, disposable, easy to perform/interpret, requires no special equipment or training and is complementary test to blood culture and Widal typhoid fever diagnosis (14).

There were different studies conducted in various parts of Pakistan. A study conducted in Karachi showed about 43% of serologically positive cases, of whom 21% were IgM positive, IgG was present in 1.47% and 19.7% were declared positive for both IgM and IgG antibodies (15). This study showed 29.2% IgM positive cases (both male and female), 1.2% positive IgG antibodies (again both male and female) and 1.9% patients positive for both IgG and IgM antibodies. These differences depend upon the climates.

In another study conducted in Islamabad in 2015, 63% women were IgM positive and 37% men were IgM positive. Similarly, both IgM and IgG antibodies were present in 42% of males and in 48% of females (16). Our study showed a small difference in that IgM positive rate is lower due to proper hygienic condition. In males we found 28% IgM positive cases which are again less than in the other study due to proper hygienic condition. Both IgG and IgM antibodies rates were much higher than in our study due to the lack of awareness and improper hygienic condition. Similarly, in percent of patients with both IgM and IgG antibodies was also very high due to the lack of education and using improper drinking water.

This study shows that females are more infected from typhoid is compared to males, whereas Fazile and Khan et al. (17) reported that females were less infected than males. Another study in Khyber Pakhtunkhwa, Pakistan, found that females were more infected than males (18).

It is concluded that typhoid fever is still a burden on developing countries like Pakistan, which is mostly contributed by the rural areas due to improper sanitation and non-availability of the advanced diagnostic facilities for early diagnosis. Thus, it is necessary to build the epidemiological diseases control system as well as antibiotic therapy units in the rural areas in developing countries to control the infectious diseases. It is crucial to ensure safe water supply for drinking and identification of chronic carriers of the bacteria.

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